Developing a Comprehensive Stormwater Program under the Puget Sound Water Quality Management Plan

DRAFT 10/30/02

Background

The Puget Sound Water Quality Management Plan (management plan) is the comprehensive state and federal strategy to protect and restore the biological health and diversity of Puget Sound. Element SW-1.2 of the management plan's Stormwater and Combined Sewer Overflows Program directs every city, town and county in the Puget Sound basin to develop and carry out a comprehensive stormwater management program. Because land use decisions have a significant effect on water resources, local governments required to plan under the Growth Management Act (GMA) are also called on to use GMA planning to manage growth, curb sprawl, and protect sensitive areas so that water resources are protected (element SW-1.1). These directives comprise one portion of an overall strategy to protect Puget Sound from the adverse effects of stormwater runoff. Other elements include assignments to local governments with combined sewer overflows, businesses, universities, state and federal agencies, and tribal governments.

The Puget Sound Action Team and the Department of Ecology jointly developed this guidance to help local governments better understand what is expected of them under element SW-1 of the management plan. The guidance includes background on the stormwater program, how to obtain state technical assistance, the goal and strategy of the stormwater program in the management plan, and guidance on each element of a comprehensive stormwater program.

The Stormwater Management Manual for Western Washington (August 2001), developed by the Department of Ecology, is referenced often in this guidance. The best management practices described in the manual should be used at all new development and redevelopment project sites. Copies of the manual can be ordered from the Department of Printing at: (360) 753-6820. The manual can also be downloaded from the web at: http://www.ecy.wa.gov/programs/wq/stormwater/manual.html.
The Puget Sound Water Quality Management Plan can be ordered by calling (360) 407-7300 or by downloading it from the web at: http://www.psat.wa.gov/.

Benefits of Developing a Comprehensive Stormwater Program

Developing a comprehensive stormwater program can help a community in many ways. Managing stormwater helps reduce flooding and protects private and public property. It helps protect human health, drinking water supplies, and area streams, wetlands, and fish and wildlife habitat. And it can help a community come into compliance with state and federal stormwater mandates. While Ecology has yet to develop a National Pollutant Discharge Elimination System (NPDES) General Municipal Phase II Permit, local governments that implement comprehensive stormwater programs should be well positioned to be in compliance with the requirements of the permit, since the comprehensive stormwater program includes the minimum six elements required by the U.S. Environmental Protection Agency. And while the U.S. National Marine Fisheries Service has yet to formally approve the Tri-County 4(d) Proposal, a comparison shows that the management plan's comprehensive program contains all of the elements of the Tri-

County Proposal, with the exception of the elements on habitat acquisition, which are included in the management plan's Marine and Freshwater Habitat Protection Program. For a comparison of the various stormwater programs download a copy of the Action Team's fact sheet at: http://www.wa.gov/puget_sound/Programs/GMA/ll_table_web.pdf. Or call the Action Team at one of the numbers listed below. Developing a comprehensive stormwater program also helps a community comply with the state Water Pollution Control Act and the Puget Sound Water Quality Protection Act.

The elements of a comprehensive stormwater program are listed in the management plan and explained in greater detail in this document. All jurisdictions are expected to develop a program by March 2003, or earlier, according to the requirements and schedule in the municipal NPDES permit.

Assistance is Available
Staff at the Department of Ecology and the Puget Sound Action Team are available to help local governments develop comprehensive stormwater programs.

Department of Ecology

King, Snohomish, Skagit, Whatcom, Kitsap, Island and San Juan counties and the City of Gig Harbor – Ed Abbasi, Northwest Region, (425) 649-7227 or eabb461@ecy.wa.gov

In Clallam, Mason, Jefferson, Pierce, and Thurston counties and the City of Enumclaw – Gary Kruger, Southwest Region, (360) 407-0238 or gkru461@ecy.wa.gov.

Puget Sound Action Team

King and Pierce counties – Kathy Taylor, (253) 333-4920 or ktaylor@psat.wa.gov

Mason and Thurston counties – Stuart Glasoe, (360) 407- 7319 or sglasoe@psat.wa.gov

Island and San Juan counties – Robyn DuPre, (360) 756-5849 or rdupre@psat.wa.gov

Kitsap, Jefferson & Clallam counties – John Cambalik, (360) 582-0575 or jcambalik@psat.wa.gov

Snohomish, Skagit and Whatcom counties – Hilary Culverwell, (206) 721-4377 or hculverwell@psat.wa.gov

Puget Sound Water Quality Management Plan
Stormwater and Combined Sewer Overflows Program Goal and Strategy

The goal of the management plan's Stormwater and Combined Sewer Overflows Program is:

> *To protect and enhance the health of Puget Sounds aquatic species and habitat, natural hydrology and processes, and water quality, and to achieve standards for water and sediment quality by managing stormwater runoff and reducing combined sewer overflows.*

The strategy for achieving this goal is to:

1. ***Develop and carry out local programs that combine land use and watershed planning and comprehensive stormwater management;***

2. *Maintain minimum technical standards, issue municipal, industrial and construction National Pollutant Discharge Elimination System (NPDES) permits that are consistent with this program; and provide guidance, technical and financial assistance and training;*

3. *Manage runoff on state, federal and tribal government land;*

4. *Achieve the greatest reasonable reduction in combined sewer overflows;*

5. *Conduct cooperative research and disseminate findings; and*

6. *Measure progress through performance measures and adjust the program as needed.*

The guidance that follows, along with assistance from Ecology and Action Team staff, can help a city or county carry out the first element of the strategy: Develop and carry out local programs that combine land use and watershed planning and comprehensive stormwater

SW-1 - Local Government Planning and Stormwater Programs

Local government planning and stormwater management programs are critical components of a strategy to protect Puget Sound. Tools available to local governments include growth management and watershed planning, development regulations, capital investment and stormwater management programs. Element SW-1 calls on local governments to use all these tools to gain maximum benefit from all these measures.

SW-1.1 Growth Management Planning
Element SW-1.1 calls on local governments to use growth management planning to help them manage growth, curb sprawl, and protect their water resources.

SW-1.1 - Growth Management Planning

Every city and county required to plan under the Growth Management Act (GMA) shall review and revise, as necessary, countywide planning policies, local comprehensive plans and policies, zoning, capital facilities plans and development regulations to ensure that development does not degrade water quality, aquatic species and habitat, and natural hydrology and processes. Cities and counties should also incorporate provisions for managing stormwater into updates of their local shoreline master programs, and should designate appropriate land for future stormwater mitigation purposes. This review shall be completed according to GMA amendment timelines using best available science and shall include:

1. Designating urban growth management areas with appropriate densities and sufficient capital facilities to reduce sprawl;
2. Providing sufficient vegetative buffers and development setbacks in critical areas ordinances to protect riparian zones, shorelines, wetlands and other sensitive areas;
3. Assessing how full build-out according to the comprehensive plan will alter natural hydrology, water quality and aquatic species; and
4. Incorporating measures to retain natural hydrology and processes, such as establishing goals for limiting effective impervious surfaces and preserving open spaces and forests.

Assistance on land use planning under the GMA is available from the Office of Community Development and the Puget Sound Action Team.

Element SW-1.2 describes the comprehensive stormwater program that all cities and counties in Puget Sound should implement to protect water quality, watershed hydrology, biological resources and habitat.

SW-1.2 - Comprehensive Stormwater Programs for Cities and Counties

Every city, town and county shall develop and implement a comprehensive stormwater management program. Stormwater programs will vary among jurisdictions, depending on the jurisdiction's population, density, threats posed by stormwater, and results of watershed planning efforts. Cities and counties are encouraged to form intergovernmental cooperative agreements in order to pool resources and carry out program activities most efficiently. Programs shall include:

1. Stormwater controls for new development and redevelopment
2. Stormwater site plan review
3. Inspection of construction sites & maintenance of temporary BMPs
4. Maintenance of permanent facilities
5. Source control program
6. Illicit discharges and water quality response
7. Identification and ranking of problems
8. Public education and involvement
9. Low Impact Development practices
10. Watershed or basin planning
11. Create local funding capacity
12. Monitor program implementation and environmental conditions
13. Schedule for implementation

The remainder of this document is dedicated to providing greater detail on SW-1.2 - the comprehensive stormwater program.

Overall Program Outcome for SW-1 - Local Government Planning and Stormwater Programs

The anticipated *overall program outcome* for Element SW-1 is that stormwater runoff from lands within cities, towns, and counties in Puget Sound will be adequately managed. This will help protect the Sound's aquatic species and habitat, natural hydrology and processes, and water quality from the adverse effects of stormwater runoff, and help achieve state standards for water and sediment quality.

Overall Program Expectation

The *overall program expectation* for Element SW-1 is that every city and county in Puget Sound shall develop and carry out a program that combines land use and watershed planning and comprehensive stormwater management. It is expected that programs shall be developed by March 2003, or earlier, according to the requirements and schedule in the municipal NPDES permit issued by the Department of Ecology.

Discussion

Local governments that have been actively developing their programs should be well positioned to meet this directive. All cities and counties were to have developed basic stormwater programs by 1995, and jurisdictions in census urbanized areas were to have developed comprehensive stormwater programs by 2000.

It is understood that stormwater programs will vary among jurisdictions, depending on the jurisdiction's population, density, threats posed by stormwater, and results of watershed planning efforts. The Action Team and Ecology expect each local government to select appropriate solutions to meet their unique needs. Cities and counties are encouraged to form intergovernmental cooperative agreements in order to pool resources and carry out program activities most efficiently.

The March 2003 deadline was chosen to coincide with the timeline established by the U.S. Environmental Protection Agency for implementation of NPDES Phase II municipal permits. The elements of a comprehensive stormwater program include the minimum six elements contained in the NPDES Phase II Rule, so by developing a comprehensive stormwater program local governments will be well positioned to also be in compliance with their NPDES permit.

Cities and counties that carry out comprehensive stormwater programs will be in a better position to protect and restore salmon in their communities. This is critical for Puget Sound jurisdictions because of the listing of Chinook and chum salmon on the Endangered Species Act.

Cities and counties that develop and carry out comprehensive stormwater programs will be better equipped to:

- Protect homes and businesses from flooding damage;
- Protect roads and other public property from damage;
- Protect local shellfish businesses and recreational harvesting beaches;
- Protect wetlands, stream channels and fish and wildlife habitat;
- Protect aquifer recharge and groundwater quality; and
- Avoid potentially costly cleanup of contaminated sediments.

Action #1 – Require Stormwater Controls for All New Development and Redevelopment

Outcomes
All new development and redevelopment projects in the Puget Sound basin will be built with stormwater flow and treatment controls adequate to meet the overall goal of this program.

Expectations
1. Cities and counties will adopt ordinances that require the use of best management practices (BMPs) to prevent erosion and sedimentation, control stormwater flows, and provide treatment for all new development and redevelopment projects. Model ordinances are available from the Department of Ecology to facilitate the adoption of stormwater regulations. Local stormwater management ordinances should include:

    - Definitions
    - Applicability or circumstances where the ordinance applies
    - Thresholds for the minimum requirements
    - Ten minimum requirements found in Volume I of the Stormwater Management Manual for Western Washington
    - Application for and contents of Stormwater Site Plan
    - Mandatory requirements for all drainage improvements
    - Development in critical areas
    - Establishment of Regional Facilities
    - Fees
    - Review and approval of plans
    - Inspections
    - Financial instruments required
    - Ordinance applies to all governmental entities
    - Adjustments
    - Exceptions consistent with the Manual
    - Maintenance and correction of privately owned BMPs;
    - Enforcement and penalties to ensure compliance
    - Appeals
    - No Special Duty Created
    - Administration
    - Severability

2. Cities and counties will adopt Ecology's Stormwater Management Manual for Western Washington, or an alternative manual that has been approved by Ecology as being technically equivalent. Ecology's equivalency guidance is included in the Stormwater Management Manual for Western Washington. All cities and counties should adopt the Western Washington Manual until they have developed an alternative technical manual and received approval from Ecology.

3. Cities and counties will seek to achieve no net detrimental change in natural surface runoff and infiltration, particularly for new development sited outside of urban growth areas.

Action #2 – Review Stormwater Site Plans

Outcomes
Local government staff will review all new development and redevelopment project proposals to ensure that they include adequate controls for stormwater and are consistent with local requirements.

Expectations
1. Cities and counties will establish by ordinance a process for the submittal and review of detailed stormwater management plans for new development and redevelopment projects.

2. Cities and counties will adopt criteria for minimum standards to guide review of plans, as part of their routine permit review process.

3. Cities and counties will review these plans to ensure that proposed projects comply with local ordinances and standards.

4. Cities and counties may approve, conditionally approve, or deny proposed applications for new development and redevelopment. The appropriate exemption or permit will be issued after the review process is completed.

Action #3 – Inspect Construction Sites

Outcomes
Local government staff will regularly inspect construction sites to ensure that adequate erosion and sediment control measures are being used, and that BMPs are maintained.

Expectations
1. Cities and counties will adopt ordinances that require the installation and maintenance of BMPs to prevent and contain erosion, inspection of construction sites, and enforcement of violations. Enforcement options will consist of both stop work orders and penalties.

2. Cities and counties will require the use of the 12 elements of Construction Site Pollution Prevention found in Volume II (Construction Stormwater Pollution Prevention) of the Stormwater Management Manual for Western Washington. Cities and counties will use this volume for basic information on sediment and erosion control, or an alternative technical manual that has been approved by Ecology.

3. Cities and counties will hire and provide training for inspectors on the selection, installation, and maintenance of erosion and sediment control BMPs and enforcement procedures.

4. Cities and counties will inspect construction sites to ensure compliance with approved plans. Inspections will be done in a timely manner and as frequently as necessary to minimize sediment from flowing off-site to streams, rivers, wetlands, or other critical areas.

5. Cities and counties will have an erosion and sediment education program.

6. Cities and counties should require that at least one individual on-site be certificated in erosion and sediment control. Certification is available through the Association of General Contractors at: http://www.agcwa.com/public/education_foundation/

Action #4 – Maintain Permanent Facilities

Outcomes
All permanent stormwater facilities on public and private property will be regularly maintained so that they perform as designed. Professionals who perform the maintenance will receive training.

Expectations
1. Cities and counties will adopt ordinances or other enforceable mechanisms establishing responsibility for operation and maintenance of new and existing private stormwater systems and facilities. A model stormwater maintenance ordinance is available from the Department of Ecology. Maintenance ordinances should include:

    - Provisions for a regular inspection program including right-of-entry provisions and/or dedicated easements for access to private property;
    - Inspection procedures and protocols;
    - Identification of parties responsible for operation and maintenance;
    - Enforcement provisions;
    - Procedures for appropriate disposal of decant water, solids, and other substances from stormwater facility maintenance.

2. Cities and counties will use the Stormwater Management Manual for Western Washington, or an alternative manual approved by Ecology, as guidance for the maintenance and repair of permanent BMPs.

3. Cities and counties will establish programs to ensure that all permanent facilities are properly maintained. Programs will include maintenance schedules, facility and maintenance records, and policies for the desired methods and frequencies for inspecting and maintaining permanent public and private stormwater facilities. Operation and maintenance programs should include pollution prevention and good housekeeping controls for reducing or eliminating the discharge of pollutants from stormwater facilities.

4. Cities and counties will review their current practices and develop a strategy and schedule for a program for adequate disposal of street wastes consistent with Ecology's guidance for street waste disposal. The Department of Ecology is currently developing guidance on the

proper handling of street waste. Contact the appropriate staff in your region (see page 2) for a copy of it once it is completed.

5. Cities and counties will set a positive example by keeping publicly owned permanent BMPs well maintained and repaired.

6. Cities and counties will have a program to train employees to prevent and minimize stormwater pollutants from their operations (such as parks and open space maintenance, street maintenance, fleet maintenance, and storm system maintenance).

Action #5 – Control Pollution at the Source

Outcomes
Cities and counties will have a program to prevent pollutants from coming into contact with stormwater through physical separation of areas or management of activities that are sources of pollution.

Expectations
1. Cities and counties will implement a program to control sources of pollutants from new development and redevelopment projects and from existing developed land using BMPs from Ecology's Stormwater Management Manual for Western Washington, or an alternative manual approved by Ecology.

2. Cities and counties will use both structural and operational source control BMPs. *Operational* source control BMPs are non-structural practices that prevent or reduce pollutants from entering stormwater. Examples include formation of a pollution prevention team, good housekeeping practices, preventive maintenance procedures, spill prevention and cleanup, employee training, inspections of pollutant sources, and record keeping. They can also include process changes, raw material/product changes, and recycling wastes. Operational Source Control BMPs are considered the most cost-effective pollutant minimization practices.

   Structural source control BMPs are physical, structural, or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. Examples of Structural Source Control BMPs typically include enclosing and/or covering the pollutant source (e.g. within a building or other enclosure, a roof over storage and working areas, temporary tarp, etc.); physically segregating the pollutant source to prevent run-on of uncontaminated stormwater; and/or devices that direct only contaminated stormwater to appropriate treatment BMPs (e.g., discharge to a sanitary sewer if allowed by the local sewer authority).

3. Cities and counties will apply source control BMPs to roadway activities and to management of landscaped areas. Integrated pest management practices will be used for roadside and landscaped area vegetation and pest management.

Action #6 – Prevent Illicit Discharges and Respond to Water Quality Violations

Outcomes
Cities and counties will have a program to prohibit illicit discharges and dumping, and respond to water quality violations.

Expectations
1. Cities and counties will adopt ordinances to prohibit illicit discharges and dumping.

2. Cities and counties will develop programs and undertake activities to locate and eliminate illicit discharges, including:
   - Locating priority areas likely to have illicit discharges;
   - Tracing the source of illicit discharges;
   - Removing the sources of the discharge; and
   - Evaluating and assessing the program.

3. Cities and counties will respond to spills and water quality violations that are reported to them.

4. Cities and counties will have a public education program to promote, publicize and facilitate public reporting of illicit connections and discharges.

Action #7 – Identify and Rank Existing Stormwater Problems

Outcomes
Cities and counties will identify existing stormwater runoff problems, rank them in terms of priority, develop plans to fix the problems, and identify funding sources to fix the problems.

Expectations
1. Cities and counties will have ongoing programs to identify and assess potential and actual water quality problems associated with stormwater runoff. Programs will seek to protect and restore water quality and biological resources in ways that make efficient use of limited resources. The most critical problems should be addressed first.

2. Cities and counties will assess stormwater-related problems that include: illicit discharges to stormwater systems; erosion and sedimentation of water bodies; damage to streams, rivers, wetlands, and fish and wildlife habitat; and deterioration of surface water, groundwater, and/or sediment quality.

3. Cities and counties will prioritize proposed projects based upon the magnitude of the problem, effects on existing or designated beneficial uses of surface or ground waters and/or the degree of their contamination. Identifying and ranking significant pollutant sources will include a process for gathering and using adequate information to conduct planning, priority setting, and program evaluation activities. This information should include, but may not be limited to:

- Mapping of storm sewer outfalls and tributary conveyances and associated drainage areas of major outfalls;
- Land use and zoning maps;
- A data base that includes precipitation records, stormwater quality and quantity records, water quality and physical characteristics of receiving water that may be affected by stormwater runoff; and
- A description and location of major structural BMPs and other structural controls for stormwater discharges.

4. Cities and counties may choose to use watershed or basin planning processes to identify and rank existing stormwater problems.

5. Cities and counties will formulate guidance to develop and implement priorities, programs, and projects, using the following criteria:

   a) *Balance of Preventive and Corrective Programs*: Stormwater management programs are expected to have a mix of preventive and corrective programs and projects. The appropriate balance between preventive and corrective efforts should be based on a needs and prioritization analysis. The allocation of resources among preventive and corrective programs should reflect the overall goals of improving, maintaining, or preventing degradation of beneficial uses and making progress in the following areas:

      - Reducing the discharge of pollutants and adverse effects to receiving waters;
      - Eliminating illicit discharges; and
      - Making progress toward compliance with surface water, groundwater, and sediment standards.

   b) *Priority on Source Controls*: In areas where water quality has not been substantially degraded, keeping pollutants out of the environment is generally the most effective, least expensive, and most efficient means of preserving water quality. Therefore, high priority should be given to source control measures in these areas.

   c) *Cost-effectiveness as a Criterion for Prioritization*: The costs of implementing solutions weighed against the expected benefits may be used as a criterion for establishing priorities.

   d) *Consideration of Community Values*: Jurisdictions may set priorities and allocate resources based on the relative importance of beneficial uses to the community. Protection and enhancement of beneficial uses determined through public involvement to be of high value to the community is an important criterion for establishing priorities and funding programs.

   e) *Stormwater Management Programs Expected to Evolve*: The activities and funding allocations established in a stormwater management program are expected to evolve over time. Factors that promote evolution include the availability of new information,

correction or minimization of previously identified problems, shifting public issues and priorities, issuance of new NPDES permits, and new environmental initiatives.

6. Cities and counties will:
   - Include a public education/outreach element that involves the public in developing, implementing and reviewing local stormwater program priorities;
   - Conduct dry weather surveys of outfalls and test for selected pollutants as part of a procedure for locating illicit discharges;
   - Conduct a hydrologic analysis and map stormwater drainages, outfalls and impervious surfaces by watershed;
   - Develop plans and schedules to identify funding to fix problems; and
   - Coordinate with other jurisdictions in a watershed or basin to correct common problems.

7. Cities and counties are encouraged to:
   - Participate in watershed, basin or similar planning process
   - Minimize the time needed to correct and/or prevent stormwater problems consistent with the resources available.

Action #8 – Educate and Involve the Public

Outcomes

Citizens, businesses, elected officials, site designers, developers, builders, and other members of the community will have an increased awareness of and appreciation for stormwater-related issues. These groups will have knowledge of and access to practical alternatives to actions that harm Puget Sound.

Expectations

1. All cities and counties will have a stormwater public education and involvement program for residents, businesses, elected officials, and employees of the municipality.

2. These programs will educate about the effects of stormwater runoff on water quality, streams, wetlands, and fish and wildlife habitat, and provide practical alternatives to actions that degrade water quality and biological resources.

3. All cities and counties will emphasize pollution prevention of stormwater problems in their educational programs.

4. All cities and counties should consider:
   - Involving citizens in the development and implementation of their stormwater education and involvement programs; and
   - Using citizen volunteers to educate other individuals about the program, assist in program coordination, and/or participate in volunteer monitoring efforts.

5. Outreach programs should inform individuals, households, and targeted groups of business and industry about steps they could take to prevent pollutants from mixing with stormwater runoff. Cities and counties should consider including the following in their programs:
   - Proper use and disposal of pesticides, herbicides, and fertilizers, and use of non-toxic alternatives;
   - Use of native plants in landscaping rather than lawns, and retention of native vegetation;
   - Preventive car maintenance, including proper disposal of used oil, coolant, and other toxic materials;
   - Use of rain barrels or cisterns to collect and reuse rainwater for landscape watering;
   - Use of permeable pavement for driveways and patios;
   - Impacts of illicit discharges and dumping, and prevention techniques;
   - Proper disposal of pet waste and livestock waste;
   - On-site sewage system maintenance to prevent pollution.
   - Training of construction contractors and developers on preparing stormwater site plans and installing and maintaining BMPs for construction activities;
   - Training for homeowner associations, businesses and others on the proper maintenance of permanent BMPs; and
   - Training for local businesses on various source control techniques.

Action #9 – Use Low Impact Development Practices

Outcomes

Cities and counties will use appropriate low impact development (LID) practices in new development, redevelopment, and retrofit projects as a means of improving stormwater management, improving protection of water resources, and creating a greener, more attractive community for their citizens.

Expectations

1. Cities and counties will educate themselves about LID practices.

   Discussion: LID practices are innovative land development and stormwater management practices that use multiple, small-scale hydrologic controls throughout a site to more closely mimic pre-developed stormwater runoff conditions. Common LID practices include reducing and disconnecting impervious surfaces, bioretention, permeable pavement, open swales, green roofs, soil amendments, and water collection/reuse.

   Low impact development includes:
   - Maintaining the pre-development, undisturbed stormwater flows and water quality;
   - Retaining native vegetation and soils to intercept, evaporate and transpire stormwater on the site (rather than using traditional ponds and conveyances);
   - Emphasizing a higher standard of soil quality in disturbed soils (by using compost and others methods) to improve infiltration, reduce runoff and protect water quality;
   - Clustering development and roads on the site and retain natural feature that promote infiltration; and
   - Reducing impervious surface area and using permeable surfaces.

There are many opportunities to learn more about LID, including attending one of the many workshops on LID practices; downloading information from the Puget Sound Action Team's web site at http://www.wa.gov/puget_sound/Programs/LID.htm; or visiting other web sites, such as the Low Impact Development Center at: http://www.lowimpactdevelopment.org/.

2. Cities and counties will review existing ordinances and regulations to determine which need to be revised to allow for LID projects. Following this review, cities and counties will make necessary revisions so that LID projects can be built without needing numerous variances. Local government staff should examine, at a minimum, their drainage manual, subdivision and zoning codes, and their comprehensive plan, if planning under the Growth Management Act.

3. Cities and counties will incorporate appropriate LID practices into new development, redevelopment, and retrofit projects.

4. In reviewing and approving new development proposals, particularly for those located outside of urban growth areas, cities and counties will seek to achieve no net detrimental change in natural surface runoff and infiltration from the site. Local governments will require stormwater controls that seek to mimic the natural, pre-development surface runoff and infiltration conditions.

5. Cities and counties will promote practices that infiltrate stormwater on-site, using proper safeguards to protect groundwater. This should have preference over collecting, conveying and treating stormwater off-site. Wherever feasible, roof runoff should be dispersed and infiltrated on-site rather than being routed to a stormwater sewer system. On sites where infiltration is limited, cities and counties will incorporate other appropriate LID practices, such as retaining native vegetation and reducing impervious surfaces.

6. Cities and counties will seek to reduce impervious surfaces, wherever feasible. Opportunities include relaxing requirements for minimum street widths and number and size of parking spaces, configuring subdivisions so that street lengths are reduced, allowing for and encouraging the use of permeable pavements, installing sidewalks on one side of the street, and using shared driveways.

7. Cities and counties will consider requiring that a portion of new development sites be retained in a native, forested state, and natural drainages and critical areas will be protected through ordinances. Cities and counties will consider applying this forest retention policy to entire watersheds to protect sensitive resources.

Research conducted by the University of Washington concludes that there is a direct link between loss of forest cover and degradation of aquatic resources. To review this research by Dr. Derek Booth, visit: http://depts.washington.edu/cuwrm/. *Click on "Research," then "Forest Cover, impervious-surface area, and the mitigation of urbanization impacts".*

8. Cities and counties will consider requiring that all soils that have been compacted or otherwise disturbed during construction be amended with organic material to restore the infiltrative capacity of the soil, provide a healthier growing media for landscaping, and reduce surface runoff. Guidance on how to achieve this can be found in the Stormwater Management Manual for Western Washington, BMP T5.13 Post-Construction Sol Quality and Depth, Volume V, Runoff Treatment BMPs).

9. Cities and counties will waive mandatory requirements for curb and gutter and storm sewers, and allow for the use of open road sections and swales, where a hydrologic analysis has determined that LID practices are appropriate.

10. Cities and counties will consider methods to collect and reuse stormwater from roofs for household use and landscape watering.

11. Cities and counties will consider providing incentives for developers to use LID practices, such as permit streamlining and reduction in impact fees.

12. Cities and counties (and private developers) that implement low impact development may enjoy a number of additional benefits, depending on the site: cost savings, added market appeal, additional green space for recreational users and greater esthetic appeal than traditional stormwater facilities.

** Note: All projects that use low impact development practices still need to meet minimum standards for flow control and treatment of stormwater. Cities and counties are expected to adopt and use the standards cited in the Stormwater Management Manual for Western Washington, or an alternative manual approved by the Department of Ecology as being technically equivalent.*

Action #10 – Participate in Watershed or Basin Planning

Outcomes

Cities and counties will participate in watershed or basin planning processes to coordinate efforts, pool resources, ensure consistent methodologies and standards, and provide better protection to water resources.

Expectations

1. Cities and counties will participate in watershed or basin planning processes, such as Chapter 400-12 WAC or Chapter 90.82 RCW, in order to coordinate efforts with other jurisdictions,

pool limited resources, ensure consistent methodologies and standards within shared watersheds, and improve protection of their watersheds.

2. Cities and counties will include biological monitoring among the methods they employ to measure the health of their watersheds.

3. Cities and counties may choose to use watershed or basin planning processes to identify and rank existing stormwater problems, set goals for limiting effective impervious surfaces, and preserve open spaces and forests.

4. Basin planning processes will use continuous runoff modeling to simulate existing and potential adverse effects of land use on the natural hydrology of the watershed.

5. Basin plans will address water quality, aquatic habitat, groundwater recharge, and water re-use.

6. Basin plans may prescribe stronger stormwater management measures to protect sensitive resources. Stormwater management standards will at least meet the minimum requirements of the Stormwater Management Manual for Western Washington.

7. Cities and counties will incorporate recommendations from watershed or basin plans and specific requirements from Total Maximum Daily Load processes into their stormwater programs, land use comprehensive plans, and site development ordinances.

Action #11 – Ensure Adequate Funding

Outcomes
Cities and counties will have adequate resources to carry out comprehensive stormwater management programs.

Expectations
1. Cities and counties will create local funding capacity, such as a utility, to ensure adequate, ongoing funding for program activities.

2. Cities and counties will have local funding capacity to contribute to regional stormwater projects.

3. A stormwater program consists of a variety of activities that require stable funding, including:
   - Planning
   - Staff
   - Public education and involvement
   - Equipment
   - Inspections
   - Maintenance and repair

- Monitoring and reporting
- Capital facilities

4. Cities and counties are encouraged to consider joint programs with other jurisdictions to share resources, coordinate activities, and carry out consistent programs.

5. Federal and state grants and loans are available for stormwater management planning, establishing stormwater utilities, and implementing specific projects:

   a) Centennial Clean Water Fund, State Revolving Fund and Federal Nonpoint Source Management Grants: Kim McKee Department of Ecology, (360) 407-6566, e-mail: kmck461@ecy.wa.gov.

   b) Coastal Zone Management Grants; Bev Huether, Department of Ecology, (360) 407-7254, e-mail: bhue461@ecy.wa.gov.

   c) Flood Control Assistance Account Program (FCAAP); Bev Huether, Department of Ecology, (360) 407-7254, e-mail: bhue461@ecy.wa.gov.

   d) Flood Hazard Mitigation and Riverine Ecosystem Restoration Program (Challenge 21); Harry Kitch, U.S. Army Corps of Engineers Planning Division, (202) 761-0115, e-mail: harry.e.kitch@usace.army.mil.

   e) Flood Mitigation Assistance Program; Federal Emergency Management Agency, phone: (425) 487-4604

   f) City Fish Passage Barrier, Stormwater and Habitat Restoration Program; Cliff Hall, Washington State Department of Transportation, Phone: 360-705-7499, allc@wsdot.wa.gov.

   g) Public Works and Development Facilities Program; A. Leonard Smith, U.S. Department of Commerce, 206-220-7660, email: lsmith7@eda.doc.gov.

   h) Public Works Trust Fund, Construction Loan Program; Public Works Board, Cecilia Gardner, (360) 725-5006, e-mail: cecilia.gardener@pwb.wa.gov.

   i) Public Works Trust Fund, Pre-Construction Loan Program; Public Works Board, Cecilia Gardner, (360) 725-5006, e-mail: cecilia.gardener@pwb.wa.gov.

   j) Transportation Equity Act for the 21st Century (TEA-21) or Washington Surface Transportation Program; Kathleen Davis, Wash. State Dept of Transportation (360) 705-7377, e-mail: davisk@wsdot.wa.gov.

6. Funding is also available to help cities and counties develop public involvement and education programs. The Puget Sound Water Quality Action Team administers the Public

Involvement and Education Program:
(http://www.wa.gov/puget_sound/Programs/Education.htm).

Action #12 – Evaluate Implementation and Effectiveness

Outcomes
Cities and counties will be able to evaluate the effectiveness of their programs by monitoring how programs are carried out, environmental conditions, and trends.

Expectations
1. Cities and counties will monitor implementation of their programs, environmental conditions in area streams, rivers and other waterbodies, and improving or declining trends in environmental health.

2. Cities and counties will consider a variety of techniques to monitor program implementation, including adoption and/or revision of ordinances and a technical manual, inspections of construction sites, maintenance of facilities, source control activities, capital facilities improvements, watershed or basin planning efforts, incorporation of low impact development practices, public education and involvement activities, development of a local funding mechanism, and monitoring.

3. Cities and counties will consider a variety of environmental monitoring techniques to document stream channel health, including water quality monitoring, monitoring of biological communities through a recognized protocol such as B-IBI (Benthic Index of Biological Integrity), and stream walks. The type and frequency of monitoring should be adequate to document current conditions and trends.

4. Cities and counties will use information gained in monitoring to help them identify and rank existing stormwater problems and finding and correcting illicit discharges.

5. Cities and counties will periodically share monitoring results with other local and state agencies, citizens and others.

6. Cities and counties will modify their stormwater programs if program objectives are not being met or improvements in water quality or biological health are not seen. Adjustments to programs are expected to be made in increments.

7. Cities and counties should consider joint monitoring programs with other jurisdictions to share resources, coordinate activities, and carry out consistent programs.

Action #13 – Develop an Implementation Schedule

Outcomes

Cities and counties will develop and use an implementation schedule to ensure that program activities are completed in a timely fashion.

Expectations

1. Cities and counties will develop an implementation schedule with specific target dates and funding sources to help plan for and implement program activities.

2. The implementation schedule will be achievable and will protect water quality and biological communities from the adverse effects of stormwater runoff.